Dagonet, *Annales Médico-Psychologiques*, Jan., 1882. Megalomania. Achille Forille, *Annales Médico-Psychologiques*, Jan., 1882. No restraint. Becoulet, *Annales Médico-Psychologiques*, Jan., 1882. Double personality. *Annales Médico-Psychologiques*, Jan., 1882. Psychology of incendiaries. Giraud, *Annales Médico-Psychologiques*, Jan., 1882. Febrile delirium among the insane. Christian, *Annales Médico-Psychologiques*, Jan., 1882.

d—NORMAL HISTOLOGY OF THE NERVOUS SYSTEM.

THE RELATION OF NERVES TO PIGMENTED CELLS.—The changes in color induced in the skin of certain animals, such as frogs, snakes, and the chameleon, by section of the nerves, or by the direct action of light, are due, as is well known, to contractile changes in the pigmented cells of the integument. These phenomena, striking in themselves, have recently assumed a new interest in view of the possible analogy existing between the movements of their processes and those of the pigmented cells of the retina, which dip down between the rods, as described by Ewald and Kühne. Hence the work of Ehrman[1] possesses an interest wider than that attaching to any simple morphological detail in the structure of the frog. E., by treatment of the skin of the back of the green frog with acetic acid and afterward with gold chloride is able to trace with distinctness the termination of cutaneous nerves in the processes of the pigmented cells. The nerves and cell processes either merge insensibly into one another, or show a sharp line of demarcation by the abrupt termination of the pigment deposit. Such a connection between nerves and the chromatophores has already been shown by Leydig to exist in snakes, but has not been demonstrated before in the frog.

Ayres[2] states that he has recently traced a direct connection between nerve fibres from the ciliary nerves and branches of pigmented cells of the choroid, in the human eye.

MINUTE STRUCTURE OF THE CORTEX OF THE CEREBRUM.—The difficulties in technique which are encountered in histological studies of the central nervous system readily account for the differences of opinion still existing in regard to the minute structure of even the most important parts of the brain and cord ; and the danger of relying upon any one mode of preparation is emphasized by Exner[1] in his recent investigations on the cortex of the human brain. His attention is chiefly directed to the upper end of both central convolutions. He soaks small pieces from the cortex of these regions in 1-per-cent. solution of osmic acid for 5 to 10 days, and treats very thin sections from these with a mixture of glycerin and aqua ammoniæ. The ammonia causes a swelling of the sustentacular tissue and the almost complete disappearance of the nerve cells and non-medullated nerve fibres ; while the medullated fibres, blackened by the osmic acid, become extraordinarily distinct, especially while the preparations are fresh. Adopting Meynert's division of the cortex into five layers, he finds that the external layer, usually described as consisting chiefly of neuroglia elements, is really largely composed of medullated nerve fibres of varying diameter, running in all directions. Those in the outermost stratum, intermingled with connective-tissue fibres, run nearly parallel with the surface, while in the inner portions medullated nerve fibres rise from the second layer, and bending over become nearly parallel with the surface. The very abundant medullated nerve fibres of the second layer have in general a smaller diameter than those in the other layers. He cannot convince himself of the division of medullated nerve fibres in the cortex, as described by Gerlach. The large spheroidal spaces which are frequently seen in the central layers of the cortex, especially in chromic acid preparations, are really only gigantic varicosities in medullated nerve fibres. It would appear from his descriptions and figures that a large part of the cortex, which has usually been regarded as "basement substance," is really composed of medullated nerve fibres, and hence is of much greater physiological importance than is commonly believed. He describes large ganglion cells, resembling Purkinje's cells, which are found in the outer layer of the cortex of the brains of newborn children, and which disappear as the individual matures, whether by absorption or by transformation into cells of the adult form, he is unable to decide. In the nuclear layer of the cerebellum, as well as in the gray matter of the cord, his method reveals unexpectedly large numbers of medullated nerve fibres.

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[1] Ehrman: Ueber Nervenendigungen in den Pigmentzellen der Froschhaut, *Sitzungsb. d. k. Akad. d. Wissensch. Math.-naturw., Cl.*, 3 Abth., lxxxvi, 167.

[2] Ayres: Contributions to the pathology of sympathetic inflammation, *Arch. of Ophthalmology*, vol. x, No. 3, p. 278, note.

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[1] Exner : Zur Kentniss vom feinerem Baue der Grosshirnrinde, *Sitzungsb. d. k. Akad. d. Wissensch. Math.-naturw., Cl.*, 3 Abth., lxxxiii, 151.

THE GANGLIONIC APPARATUS IN THE HEARTS OF VERTEBRATES.—In view of the elaborate experiments now in progress in the biological laboratory of the Johns Hopkins University, under the direction of Prof. Martin, on the isolated mammalian heart, and the definite results to which they seem likely to lead, the extended morphological researches of Vignal[1] are of interest. Employing chiefly the osmic acid and gold methods which have given such excellent results in the hands of Ranvier and his students, Vignal studied the distribution and structure of nerve cells in the heart of the ray and carp, of several species of frogs, the toad, triton, salamander, water-snake, green lizard, pigeon, and rabbit, and in the ape and man. His elaborate paper must be referred to for details. He found, so far as the warm-blooded animals are concerned, that the ganglia connected with the true cardiac plexus lie chiefly in the vicinity of the pulmonary artery and along the auriculo-ventricular grooves. In those animals in which a morphological distinction is evident between the cells of the cerebro-spinal and sympathetic systems, as in the rabbit, he found cells of both kinds, and the cells of the sympathetic were always predominant in the ganglia of the auricles; and he thinks it just to infer that the same condition exists in those animals in which structural differences in the two kinds of cells are not at present recognizable. He also concludes from numerous physiological experiments on the isolated heart, that there exist two intrinsic nerve-centres, motor and inhibitory.

NERVES OF SMOOTH MUSCLE TISSUE.—Wolff[2] has studied anew the distribution of the nerves and ganglion cells in the bladder of the frog, and finds that the smooth muscle cells are connected exclusively with nerves and cells of the sympathetic. The cells, precisely similar to those found along the course of the great sympathetic, are either grouped in small ganglia or isolated, and Wolff believes that each cell is connected, by its processes—the non-medullated nerve fibres—on the one hand, with groups of smooth muscle cells; and on the other, with the dorsal trunks of the great sympathetic. This relation is most evident in the bipolar cells; but in the cells which have three or more processes he believes the same relation to exist, only in this case several groups of muscle cells may be innervated by the different processes from a single nerve cell. Even in unipolar cells he assumes a composite character in the single process, by which it is in communication, in the same way, with both muscles and the great centres. He has nothing new to impart in regard to the minute structure of either cells or nerve fibres, and although repudiating Arnold's suggestion, that the nerves terminate in the nuclei of the smooth muscle cells, he gives us no light upon the way in which the connection is established; he is certain, however, that each muscle cell is not furnished with a separate nerve. There is no communication between the sympathetic and cerebro-spinal nerves.

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[1] Vignal: Recherches sur l' appareil ganglionaire du cœur des vertébrés, *Arch. de Phys. Norm. et Path.*, Paris, 2 s., viii, 694 *et. seq.*

[2] Wolff: Die Innervation der glatten Muskulatur, *Arch. f. mik. Anat.*, Bd. xx, Heft iii, p. 361.

The non-medullated nerve fibres, whose ramifications are numerous, are always sympathetic nerves, and not cerebro-spinal nerves which have lost the medullary sheath. His method is essentially as follows: The bladder of a freshly killed frog is fully distended through the cloaca, with a solution of gold chlorid, 1:20,000. The abdomen is now opened, and under constant irrigation of the distended bladder with the same solution, the surrounding parts are cleared away, and the anterior portion of the body cut off. The bladder, still distended and attached to the pelvis, is now placed in a solution of gold chlorid 1:2,000, and after four hours, is removed, opened, and pinned to a cork, with the inner surface uppermost. The loosened epithelium is now to be brushed off, and it is put for a few hours in another gold solution 1:6,000; then washed, and placed in water acidulated with acetic acid; left some time in the dark, and finally exposed to daylight. By this procedure the muscles are stained a light bluish-red, the medullated nerves dark bluish-red, and the non-medullated nerves and ganglion cells carmine-red.

NERVES OF THE CORNEA.—The same writer[1] studied the cornea stained with chlorid of gold and potassium. He finds, contrary to the usual belief, that the corneal nerves are everywhere medullated, except at their terminations, as at their entrance into the cornea; but the medullary sheath is composed of a modified myelin; that is, it does not contain substances allied to fat, and hence does not interfere with the transparency of the cornea. The nerves are also everywhere surrounded by a neurilemma. He thinks that the nerves terminate sometimes by free extremities in the substantia propria corneæ, sometimes between the anterior epithelial cells; they never reach the surface of the epithelium, however, nor do they terminate in the epithelial cells themselves, nor in the corneal cells. In still another series of observations on *the free endings of sensitive nerves*, Wolff[1] enunciates his belief that all sensitive nerves which do not end in special terminal apparatuses, such as tactile corpuscles, taste bulbs, retina, etc., have their free ends either in connective tissue or between the cells of epithelial tissue. He does not accept the commonly received belief that medullated nerves may lose their sheaths and proceed as naked axis-cylinders, but thinks that a medullated nerve always retains its sheath until it reaches its termination.

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[1] *Loc. cit.*, p. 373.

The error into which observers have universally fallen is due either to mistaking connective-tissue fibres for nerve elements, or to failure in recognizing the delicate sheaths, or to a failure in discerning sympathetic-nerve fibres, which are so often associated with medullated nerves in nerve trunks. While his results are suggestive and his figures very clear and persuasive, his conclusions do not always seem stamped with the highest objectivity, and he does not appear to make due allowance for the well-known fickleness of the gold method.—T. MITCHELL PRUDDEN, M.D.

BIBLIOGRAPHY.

Hansen: Terminaison des nerfs dans les muscles du corps de la sangsue. *Arch. de Phys. Norm. et Path.*, Paris, 1881, 2 s., viii, 739. *Krause:* Die Nervenendigung in den Tastkörperchen. *Arch. f. mik. Anat.*, Bd. xx, 212. *Lustig:* Ueber d. Nervenendigung in den glatten Muskelfasern. *Sitzungsb. d. k. Akad. d. Wissensch. Math-naturw., Cl.*, Abth., 3, p. 186. *Schöbl:* Ueber d. Blutgefässe des cerebrospinalen Nervensystems der Urodelen. *Arch. f. mik. Anat.*, Bd. xx, 87. *Stirling:* On the nerves of the lungs of the newt. *Journ. Anat. & Phys.*, London, vol. xvi, p. 96. *Richardson:* On a double staining for nerves. *Journ. Royal Mic. Soc.*, London, vol. i, p. 573. *Bernard:* Études sur les nerfs sensibles des tendons. Bordeaux, 1881. *Luys:* Contribution à l' étude de la structure de la cellule nerveuse, étudiée à l' aide de la méthode photomicrographique. *Encéphale*, Part I, 412. *Klug:* Ueber die Herznerven des Frosches. *Arch. f. Anat. u. Entwicklungsgesch*, Leipzig, Oct., 1881, p. 331.

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[1] *Loc. cit.*, p. 377.